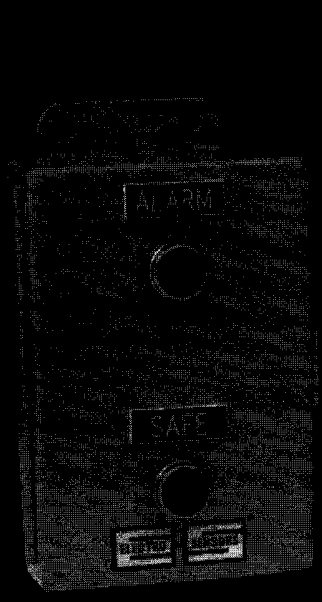
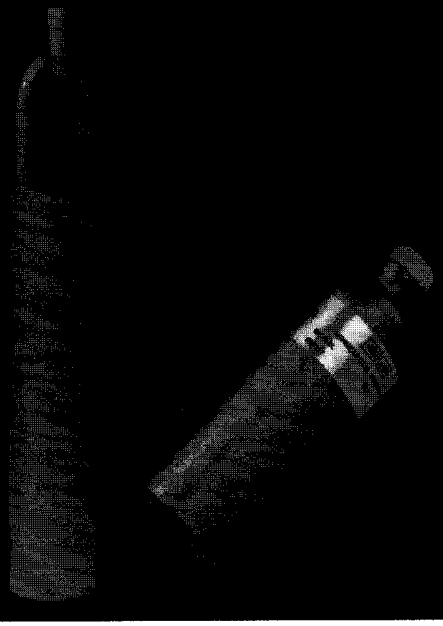
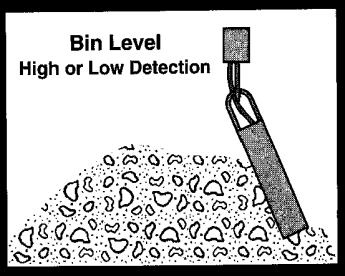
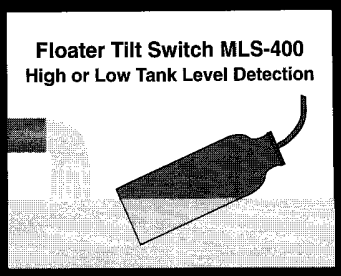
# ELECTRO SENSORS Tilt Switches

## MTS-200 • MTS-300 • MLS-400 • SCU-200 Control Unit






### Features:

- **Easy to Install—Requires Little Maintenance**
- **Control Unit will Interface with Any Tilt Switch Probe**
- **Advanced Solid State Electronic Circuitry**
- **NEMA 12 or Optional NEMA 4 Enclosure**
- **Accepts a Wide Variety of Optional Sensors for Special Applications**
- **Adjustable Time Delay Prevents False Indication**
- **Rugged Welded Steel Probes**
- **Floater Probe for Liquids and Slurries**
- **Optional Stainless Steel Probes Available**

### Description:

The Electro-Sensors Tilt Switch System is a simple system consisting of a control unit and a sensing probe. It is widely used in the process industry to sense the presence or absence of any bulk material. Typical applications include, high or low bin level alarms, detection of transfer chute plug-up, control of material depth in crusher bowls, and the sensing of alarm conditions in rock box, screen classifier, etc.

Normal or safe condition may be vertical, as in a screen classifier properly loaded—an excessive level tilts the probe to indicate an alarm. Normally tilted condition is typified by material flowing on a conveyor belt—loss of material will drop the probe to the vertical position to indicate an alarm.

### Principle of Operation:

The Electro-Sensors Tilt Switch Probes feature rugged welded steel construction. They are waterproof, dusttight, airtight, and have a stress relieved cable. The mercury switch inside the probe is epoxy encapsulated to seal it from the most severe environmental conditions.

The probe mounted in a vertical position has closed contacts. As it is tilted to approximately 15-degrees, contacts will open. The contacts have a maximum capacity rating of 230 Vac, 1.7 Amps. The probe is supplied with a flexible 8-foot Neoprene jacketed 18-gauge, two-wire conductor cable suitable for conduit or stand-alone wiring.

### SCU-200 Control Unit:

The SCU control unit provides a safe low voltage power source for any probe. Input from the probe is switch selectable, so that either tilted or vertical position may be selected as "safe." The opposite position results in alarm, following an adjustable 1–99 second delay. The delay assures reliable performance, free from false alarms, because only a sustained change in the probe position will initiate an alarm. Lamps are mounted on the face of the enclosure to indicate the SAFE/ALARM status of the output relay (5 amp DPDT). The Control is "fail safe," relay failure or power loss causes an immediate "alarm".

### Installation Instructions:

The probe may be suspended from the eyelet or by the optional threaded hanger. The cable length should be adjusted so that it will not affect tilting of the probe body. The Control Unit may be remotely located in any convenient place. See wiring diagram for terminal block layout.

### Hangers, MTS-20H, MTS-30H:

Tilt Switch Hangers are available for the MTS-200 and MTS-300 probes. All welded steel, to match the probe body, the hangers are threaded to screw directly onto 1/2-inch NPT conduit.

### Floater Switch, MLS-400

The Floater Probe is used in liquids, slurries or powders. The anodized aluminum body is light enough to reliably sense material exceeding 0.5-density. They are ideal for high or low sump control, fly ash, flour, etc.

### Auxiliary Sensor Power:

The SCU-200 Control Unit has a transducer input feature that adds to its versatility. Terminal TB2-1 is a 12 Vdc transducer supply terminal that will enable the use of open collector sensors such as Hall Effect and proximity sensors with the control unit. This feature may be used in a wide variety of sensing applications where an adjustable relay output is desired when the sensor detects a target.

## Electro-Sensors, Inc. Tilt Switches

### Time Delay Adjustment:

The Time Delay Function is adjustable from 1–99 seconds. Use a small screwdriver to turn the rotary switches S2 and S3 for the desired time delay interval. Switch S2 adjusts for single seconds, and switch S3 adjusts for tens.

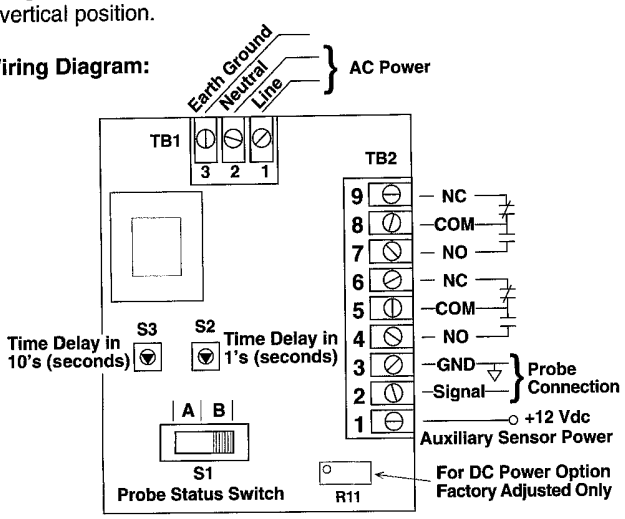
*Example: A time delay of 14-seconds would require S2 to be set at 4, and S3 to be set at 1.*

### Probe Status Switch:

With the probe status switch in the "A" position, the relay is energized, and the green "SAFE" lamp is lit when the probe is tilted.

With the probe status switch in the "B" position, the relay is energized and the green "SAFE" lamp is lit when the probe is in a vertical position.

### Wiring Diagram:




### Standard Probe Connections:

All Tilt Switch probes should be connected to terminals TB2-2 and TB2-3.

### Alternate Sensor Connections:

Transducer Power TB2-1
Transducer Signal TB2-2
Transducer Ground TB2-3

### SCU-200 Control Unit Specifications:

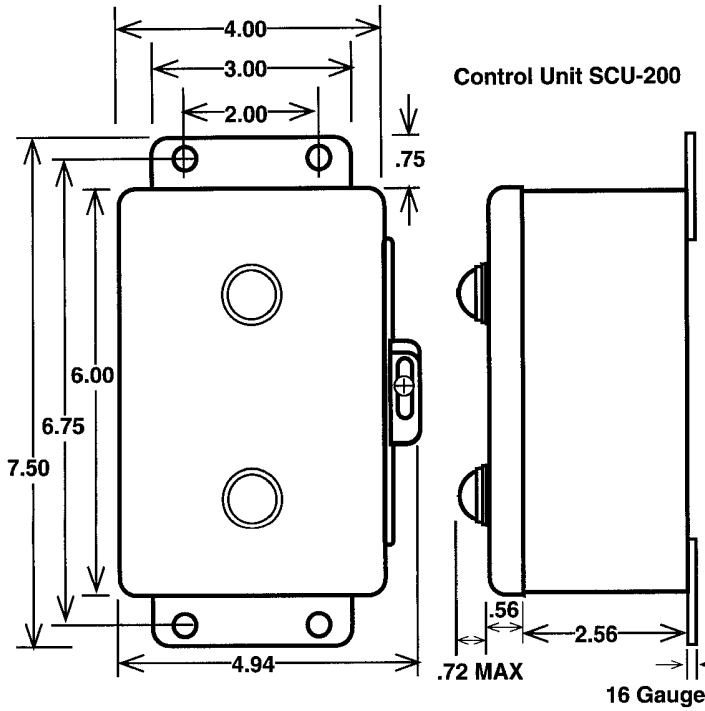
| | |
|---|---|
| Enclosure | NEMA 12, 6 x 4 x 3 inch<br>NEMA 4 optional |
| Input Power | 115 Vac ±10% 50/60 Hz<br>optional 230 Vac, 12/24 Vdc |
| Probe Signal Voltage | ±12 Vdc (10 kΩ pull-up to +12 Vdc) |
| Auxiliary Sensor Supply Voltage | +12 Vdc @ 17 mA max |
| Relay Output | DPDT Form C relay, rated 5 Amp @250 Vac resistive load |
| Relay Status | Switch Selectable |
| Relay Status Lamps | 2 replaceable lamps, 28 Vac |
| Wiring Connections | Screw barrier terminal 14 AWG max |
| Operating Temperature | 0°C to +70°C |
| Storage Temperature | -20°C to +70°C |

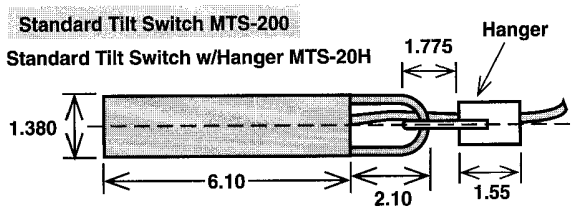
| Probes: | MTS-200 | MTS-300 | MLS-400 |
|---|---|---|---|
| Contact Rating (all) | 1.7 Amp max. at 250 Vac SPST | | |
| Contact Type | Mercury | Mercury | Mercury |
| Probe Actuation Angle | 15° ±5° | 15° ±5° | 15° ±5° |
| Weight | 18 oz | 75 oz | 8 oz |
| Cable | 8 ft, 18 gauge 2 cond Neoprene | 8 ft, 18-gauge 2 cond Neoprene | 8 ft, 18-gauge 2 cond Neoprene |
| Enclosure | Steel | Steel | Aluminum |

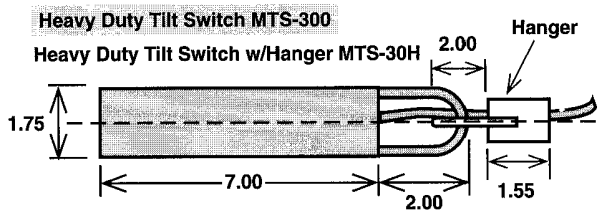
**Specifications Subject to Change Without Notice.**

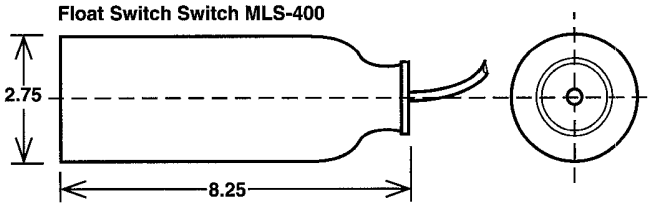
### Dimensional Drawings:

Dimensions In Inches





CALL TOLL FREE FOR MORE INFORMATION

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